Runoff Risk Decision Support

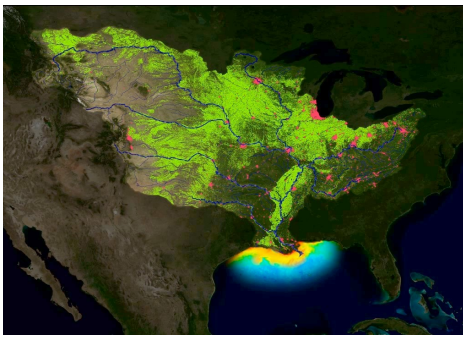
Utilizing NWS Modeling to Help Improve the Nation's Water Quality

WHAT IS RUNOFF RISK DECISION SUPPORT?

Runoff Risk decision support is real-time forecast guidance focused on improving nutrient application timing decisions so that freshly applied nutrients are not promptly transported from fields and into streams and lakes. Relying on National Weather Service (NWS) modeling, on-farm monitoring data, and multi-partner collaboration, these state led tools are a comprehensive science based approach addressing desired state and regional nutrient reduction goals. Ultimately Runoff Risk decision support will focus attention on nutrient application timing and eventually encourage *voluntary* behavioral change as farmers incorporate this concern into their short-term planning.

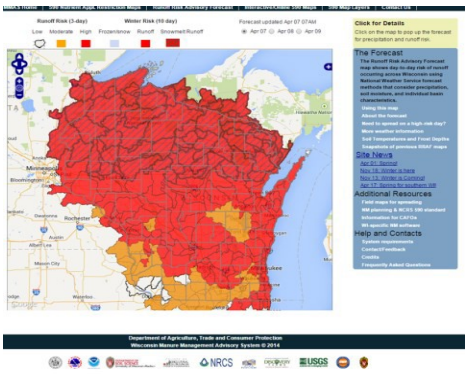
WHY IS RUNOFF RISK DECISION SUPPORT NEEDED?

Many of the nation's lakes and streams suffer from water quality degradation caused by excess nitrogen and phosphorus. These nutrient loads eventually concentrate in coastal areas such as the Great Lakes and Gulf of Mexico, contribute to harmful algal blooms and hypoxia, and result in both economic and environmental impacts. The Gulf of Mexico Hypoxia Task Force as well as the binational Great Lakes Water Quality Agreement have called for substantial nutrient load reductions from upstream states due to the increasing severity of ecosystem impacts.



Research has shown nonpoint nutrient sources, such as agricultural runoff, are a major source of these nutrients. Further, studies have indicated a few large runoff events per year can contribute a large portion of the annual load. As applications generally occur during the riskiest times of year for runoff (fall through spring) it is easy to understand why there is strong demand for short-term Runoff Risk decision support tools.

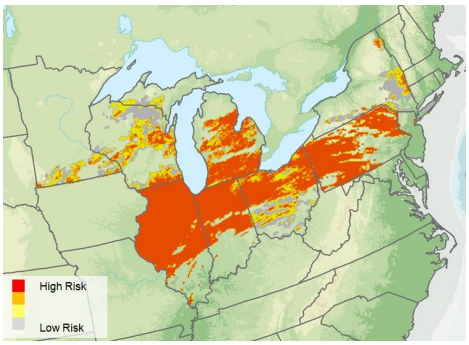
Highlighting the need for this type of tool, Runoff Risk was initiated by Wisconsin legislative action in 2006 after a winter and spring with many contaminated runoff events. A state agriculture extension agent's knowledge of NWS modeling helped incorporate the NWS into a multi-partner working group that developed the first generation Runoff Risk tool in Wisconsin, the Runoff Risk Advisory Forecast (RRAF).



Version 1 of Wisconsin's Runoff Risk Advisory Forecast, developed in collaboration with the state, NWS North Central River Forecast Center and many additional partners.

HOW IS RUNOFF RISK INFORMATION GENERATED?

Forecast models used by the NWS North Central River Forecast Center (NCRFC) incorporate forecast precipitation and temperatures to predict snowmelt, continuous soil conditions, and runoff ten days into the future. State working groups helped correlate simulated runoff to on-farm edge-of-field data. This process allows risk categories to be identified in each forecast run across their state. The States also create maps and develop websites for farmers and producers in their states. It is important to note that Runoff Risk intended to supplement decisions and is not promoted as a regulatory tool.



Runoff Risk Version 2 is being developed across the Great Lakes region.

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WHO CAN I CONTACT FOR MORE INFORMATION?

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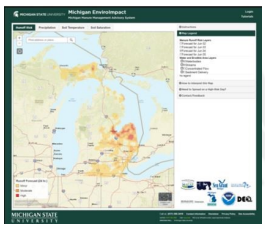
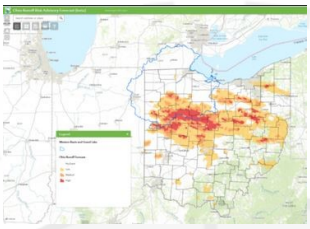
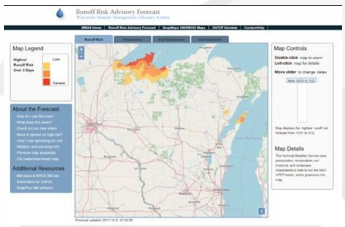
GREAT LAKES RESTORATION INITIATIVE SUPPORT

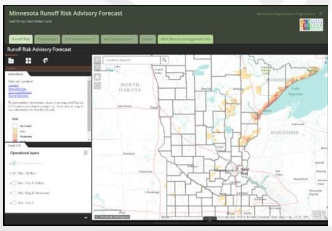
The NWS North Central River Forecast Center (NCRFC) partnered with the Great Lakes Restoration Initiative (GLRI) and the Environmental Protection Agency (EPA) in 2014 to expand and improve the Runoff Risk tools across the Great Lakes region. A second version of the Runoff Risk tools has rolled out in MN, MI, WI, and OH. Collaboration in IN, IL, and NY is expected to begin in 2018.





Great Lakes RESTORATION





FUTURE IMPROVEMENTS

The demand for Runoff Risk decision support guidance is expected to grow with increasing awareness of these tools in addition to more attention focused on nutrient pollution impacts to the Great Lakes and the Gulf of Mexico. The NWS and State partners are planning for continual Runoff Risk improvements in the future. Starting in 2018, GLRI is helping to kick start a new project that will develop a version 3 Runoff Risk out of the new NOAA National Weather Service National Water Model (NWM) framework.

MULTI-PARTNER COLLABORATION IS ESSENTIAL

Runoff Risk decision support tools are a unique example of collaboration between state working groups, federal and state agencies, universities, and the agricultural industry to develop real-time tools providing farmers and producers guidance which could help states meet nutrient reduction goals. The Great Lakes Restoration Initiative has been instrumental in the advancement and expansion of Runoff Risk decision support. NOAA Sea Grant and NOAA Regional Collaboration Teams have provided support in facilitating regional networks, expertise, communication, and outreach in support of this effort. Additionally, the NOAA Central Region Team supported the production of a full length video and short trailer to educate on hypoxia, HABs, and Runoff Risk Decision Support (youTube: "Runoff Risk").

Runoff Risk Background Information:
https://vlab.ncep.noaa.gov/web/noaa-runoff-risk/runoff-risk-background

MI: https://enviroimpact.iwr.msu.edu
MN: http://mda.state.mn.us/rraf
OH: http://www.agri.ohio.gov/divs/plant/OhioApplicatorForecast/oaf.aspx
WI: http://www.manureadvisorysystem.wi.gov/app/runoffrisk